Collaborative
ADVANCED KNOWLEDGE TECHNOLOGIES

# CoAKTinG

in the Grid



**Simon Buckingham Shum**
**David De Roure**
**Marc Eisenstadt**
**Nigel Shadbolt**
**Austin Tate**

CoAKTinG will provide tools to assist scientific collaboration by integrating intelligent meeting spaces, ontologically annotated media streams from online meetings, decision rationale and group memory capture, meeting facilitation, issue handling, planning and coordination support, constraint satisfaction, and instant messaging/presence.

http://www.aktors.org/coakting/

# Context

- UK e-Science programme
  - E-Science *versus* Grid
  - Focus on the e-Scientist
- Semantic Grid
  - www.semanticgrid.org
- Interdisciplinary Research Collaborations

# Team

## Southampton IAM

David De Roure

Nigel Shadbolt

Danius Michaelides

Richard Beales, Kevin Page and Ben Juby

## Open University KMI

Marc Eisenstadt

Simon Buckingham Shum

Jiri Komzak

Michelle Bachler

## Edinburgh AIAI

Austin Tate

Stephen Potter

Jessica Chen-burger

Jeff Dalton

# Overview

- Tools and technologies
- Scenario
- Smart spaces

# Tools and Technologies

# Technologies we need

- Systems to enhance!
- Ontologically annotated audio/video streams
- Issue handling, tasking, planning and coordination
- Collective sensemaking and group memory capture
- Enhanced presence management and visualisation

# Tools on the table

- KMI
  - BuddySpace
  - Compendium
- AIAI
  - Process panels
- Southampton
  - HyStream
  - COHSE

- Telephone conference
- Access Grid
- VRVS
- NetMeeting
- Messenger
- Webex

# Jabber

- Jabber is a set of XML-based protocols for real-time messaging and presence notification.
- Communicates with other instant messaging services through gateways
- Many clients available – see

  http://www.jabbercentral.org/

# BuddySpace

- ‘Enhanced Presence Management for Collaborative Working, Messaging, Gaming and Beyond’
- The concept of presence has become a rich combination of attributes that can be used to characterise an individual's…
  - physical and/or spatial location
  - work trajectory
  - time frame of reference
  - mental mood
  - goals and intentions

http://kmi.open.ac.uk/projects/buddyspace/

# Compendium

- Provides a methodological framework, plus an evolving suite of tools, for **collective sense-making** and **group memory**.
- Intersection of collaborative modelling, organisational memory, computer-supported argumentation and meeting facilitation.
- Centres on face-to-face meetings, potentially the most pervasive knowledge-based activity in working life, but also one of the hardest to do well.

Compendium offers strategies for tackling several key challenges in managing knowledge:

- improving communication between disparate communities tackling ill-structured problems
- real time capture and integration of hybrid material (both predictable/ formal, and unexpected/informal) into a reusable group memory
- transforming the resulting resource into the right representational formats for different stakeholders.

http://www.compendiuminstitute.org/

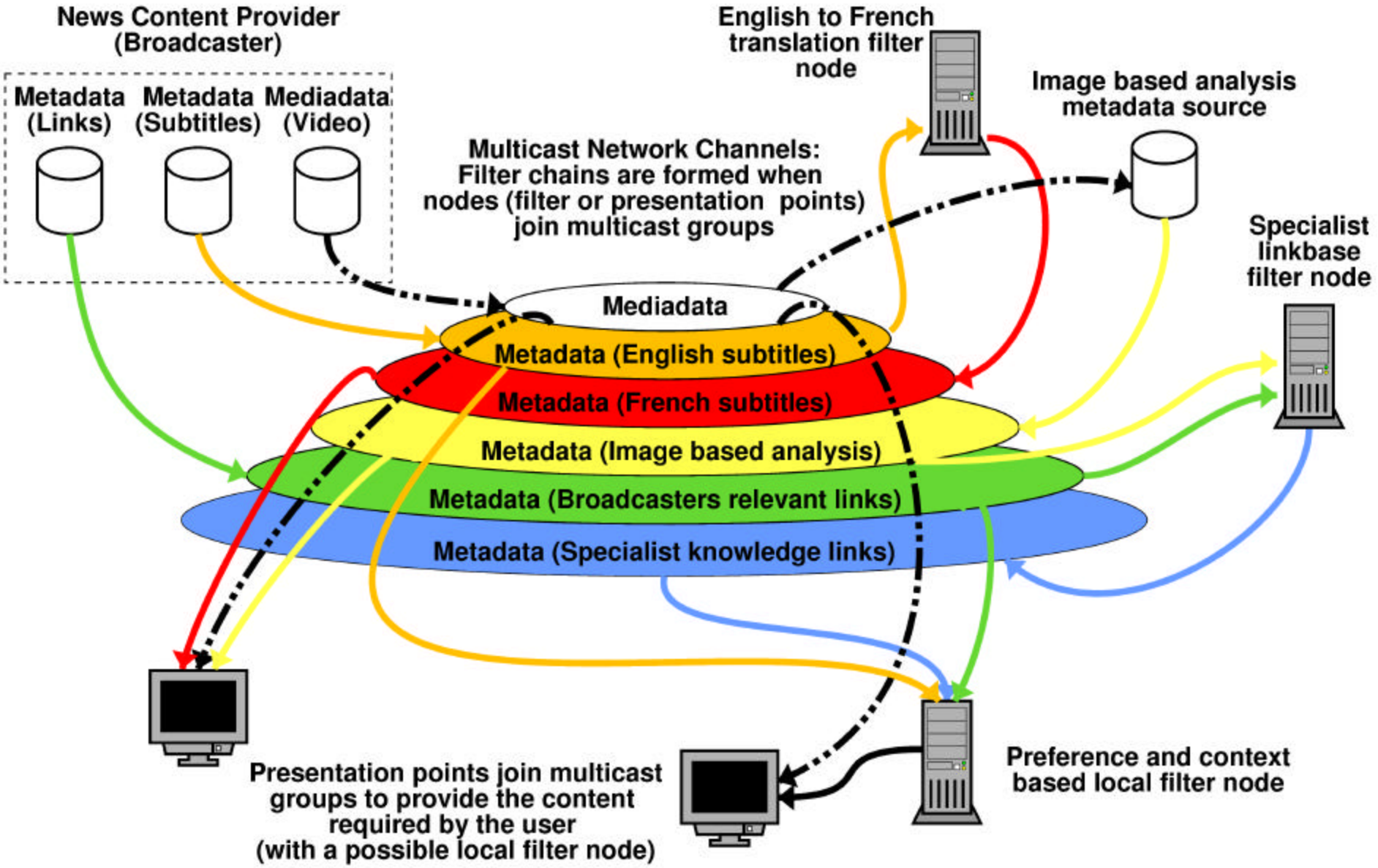
# Process Panels

- Uses the core notion of the representation of a product as a set of nodes making up the components of the product model, along with constraints on the relationship between those nodes and a set of outstanding issues
- Investigates the use of shared models for task directed communication between human and computer agents who are jointly exploring a range of alternative options for activity.
- Five concepts are being used as the basis for exploring task orientated multi-agent and mixed-initiative work involving users and systems…

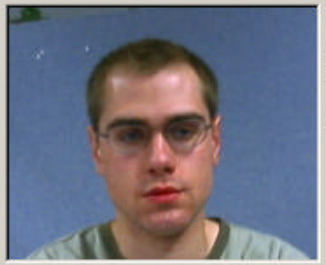
# <I-N-C-A>

## Issues, Nodes, Constraints and Annotations

1. **Shared Object/Product Model** - a structured representation of the object being modelled or produced using a common constraint model of the object or product
2. **Shared Planning and Activity Model** - a rich plan representation using a common constraint model of activity
3. **Shared Task Model** - Mixed initiative model of "mutually constraining the space of objects/products".
4. **Shared Space of Options** - explicit option management.
5. **Shared Model of Processing Capabilities** - handlers for issues and constraint managers.
6. **Shared Understanding of Authority** - management of the authority to do work (to handle issues)


News Content Provider
(Broadcaster)
Metadata (Links)
Metadata (Subtitles)
Mediadata (Video)
English to French translation filter node
Image based analysis metadata source
Multicast Network Channels:
Filter chains are formed when nodes (filter or presentation points) join multicast groups
Specialist linkbase filter node
Mediadata
Metadata (English subtitles)
Metadata (French subtitles)
Metadata (Image based analysis)
Metadata (Broadcasters relevant links)
Metadata (Specialist knowledge links)
Presentation points join multicast groups to provide the content required by the user
(with a possible local filter node)
Preference and context based local filter node

# HyStream



Name

Ben Juby

Don Cruickshank

**Remote Documents** ☐ Auto Follow

☑ Show Expired ☐ Show Local Docs

IAM Group

Pervasive Computing and Networks

Projects

t120_primer.pdf

Jabber @ KMi

Share Document ☐ Auto Share Annotate <- -> Bookmarks

Location http://www.iam.ecs.soton.ac.uk/

**Intelligence, Agents, Multimedia Group**

**University of Southampton**

Research
Themes
People
Projects
Publications
Software

The Group
About us
Vacancies
Contact
Finding IAM
Events
Seminars

The Site
Search
Site Map
About Site

Internal Information
Web Calendar

Foxtrot Publication Database

FAQ
Technical Reports
Support

Group Activities
Social Events

Code Repository
Machine Database

One of the largest groups of its kind, with over 80 researchers, IAM focuses on the design and application of computing systems for complex information and knowledge processing tasks.

IAM is a world leader in the key technologies of agent-based computing, knowledge management, open hypermedia and pervasive computing and their application in the domains of digital libraries and grids [more].

Dept of Electronics and Computer Science

[Agent Based Computing] [Biorobotics] [Grid and Distributed Computing]
[Distributed Information Management] [Digital Libraries & Research Archiving]
[Learning Technologies] [Knowledge Technologies] [E-business Technologies]
[Multimedia and Augmented Reality] [Perception Cognition and Language]
[Pervasive Computing and Networks] [Hypermedia & Web Technologies]

Electronics and Computer Science

University of Southampton

Search IAM

Go

**Featured Project**

**Churchill Archive**

The Winston Churchill archive consists of over a million documents, ranging from handwritten letters to typed political documents. The digitisation of the archive presents a number of problems which this project aims to tackle using multimedia and hypermedia tools and technologies. [more]

5★ Electronics and Computer Science

RAE 2001

About Site

W3C MEMBER

**Annotations for "IAM Group"**

**Don Cruickshank:** PCaN stands for "Pervasive Computing and Networks"

**Ben Juby:** Head of Group is Prof. Nick Jennings

**Don Cruickshank:** IAM Group is based in the New Zepler building

My Computer

# COHSE

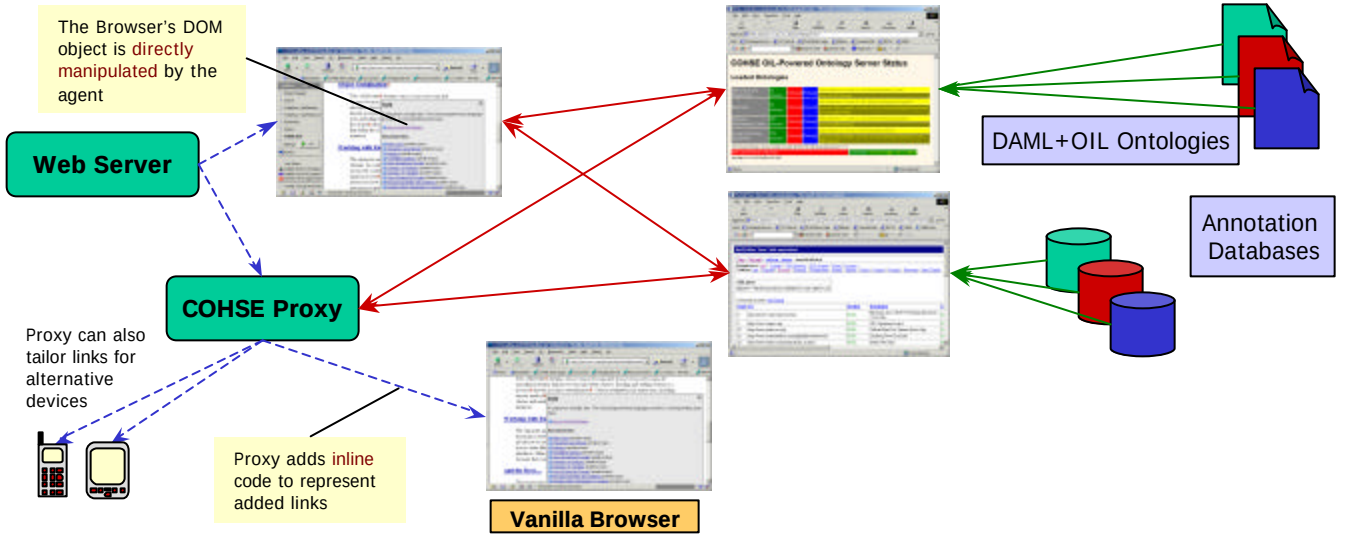
COHSE combines an Open Hypermedia System with Ontological Knowledge, to provide a framework for ontological linking.

The COHSE Agent adds links to documents. It generates and presents these links on behalf of both authors and readers. Link source anchors are determined in one of two ways:

- Through the use of some lexical matching, based on the terms that occur in the document and the terms associated with an ontology provided by an Ontology Service.
- Through the use of annotations provided by an Annotation Service.

Link targets are then found via the Annotation Service.

# http://cohse.semanticweb.org

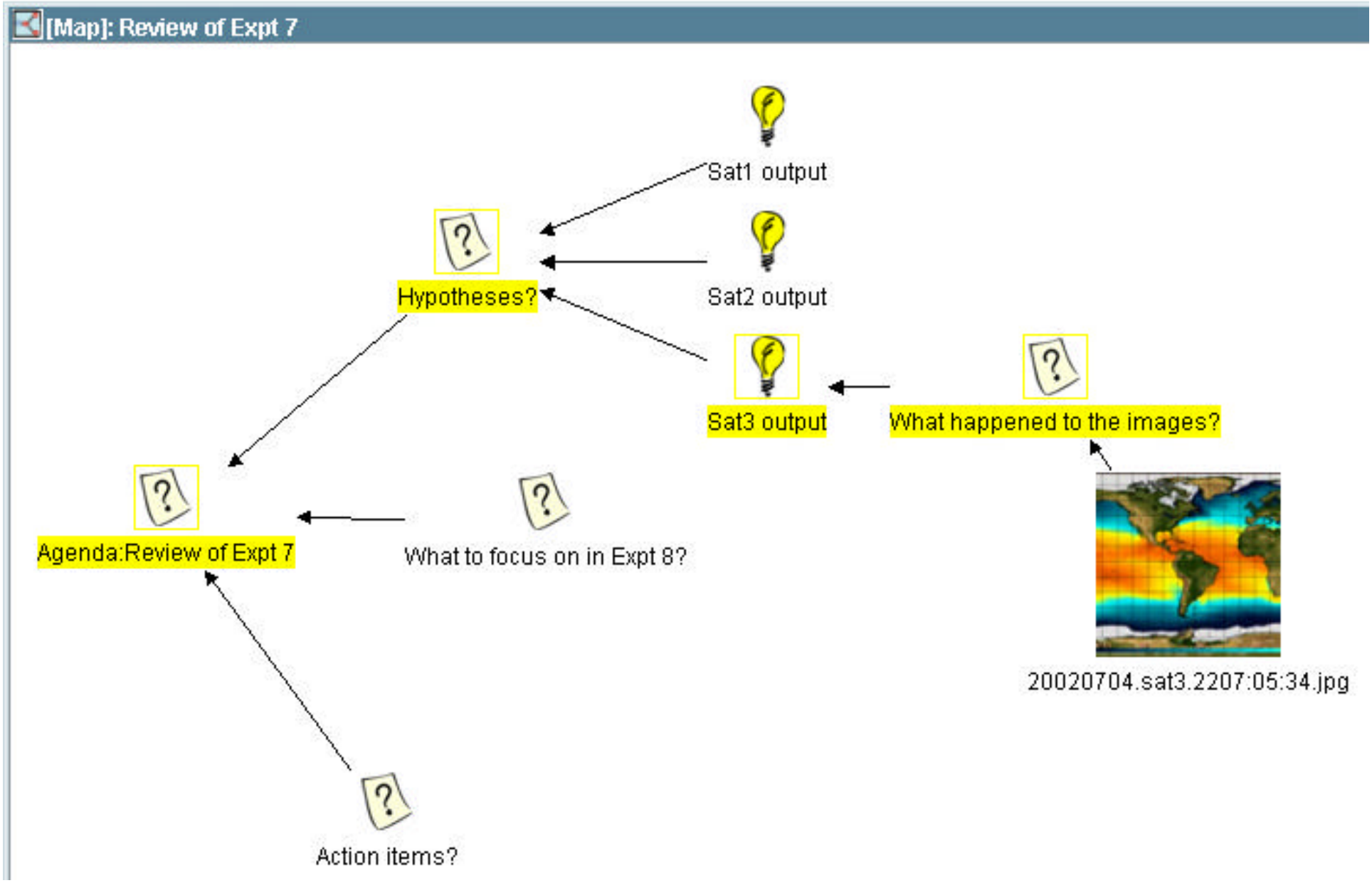


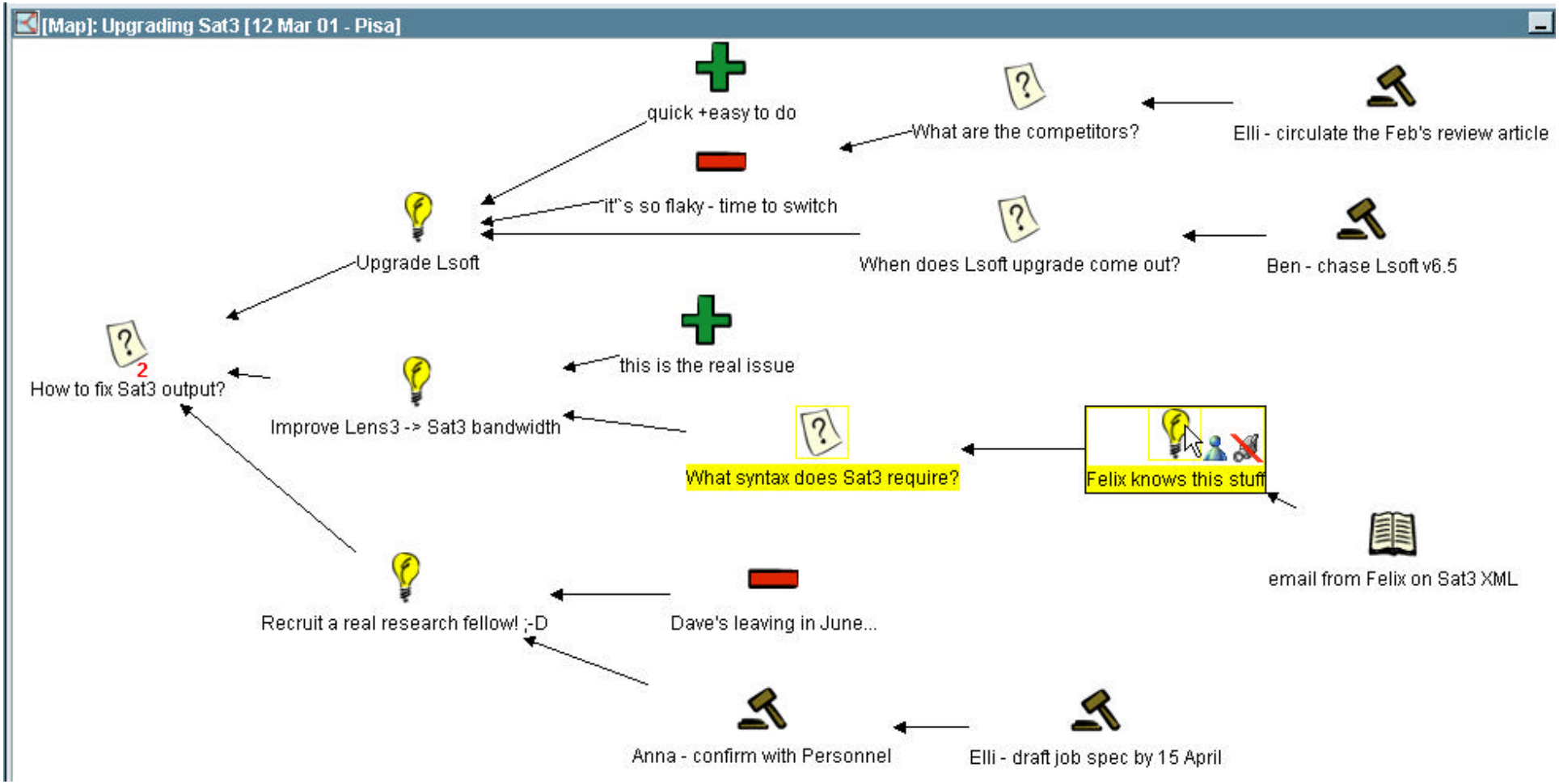

THE UNIVERSITY of MANCHESTER

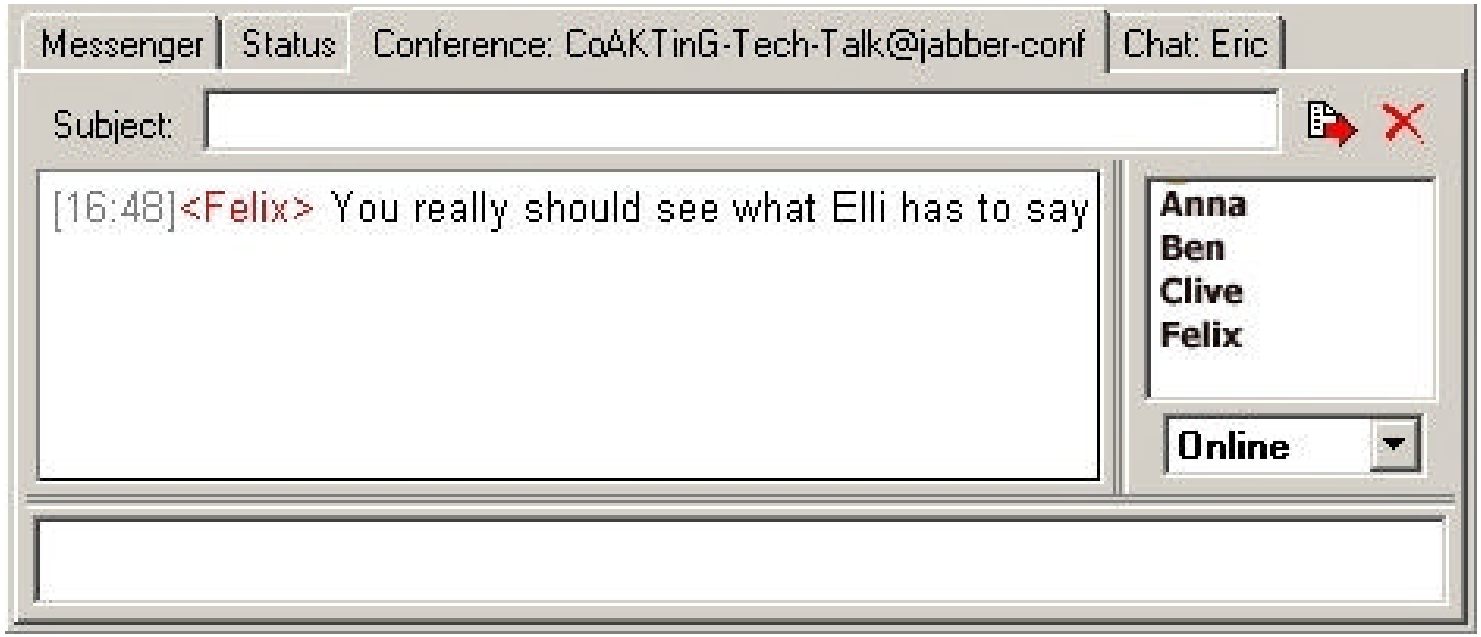
University of Southampton

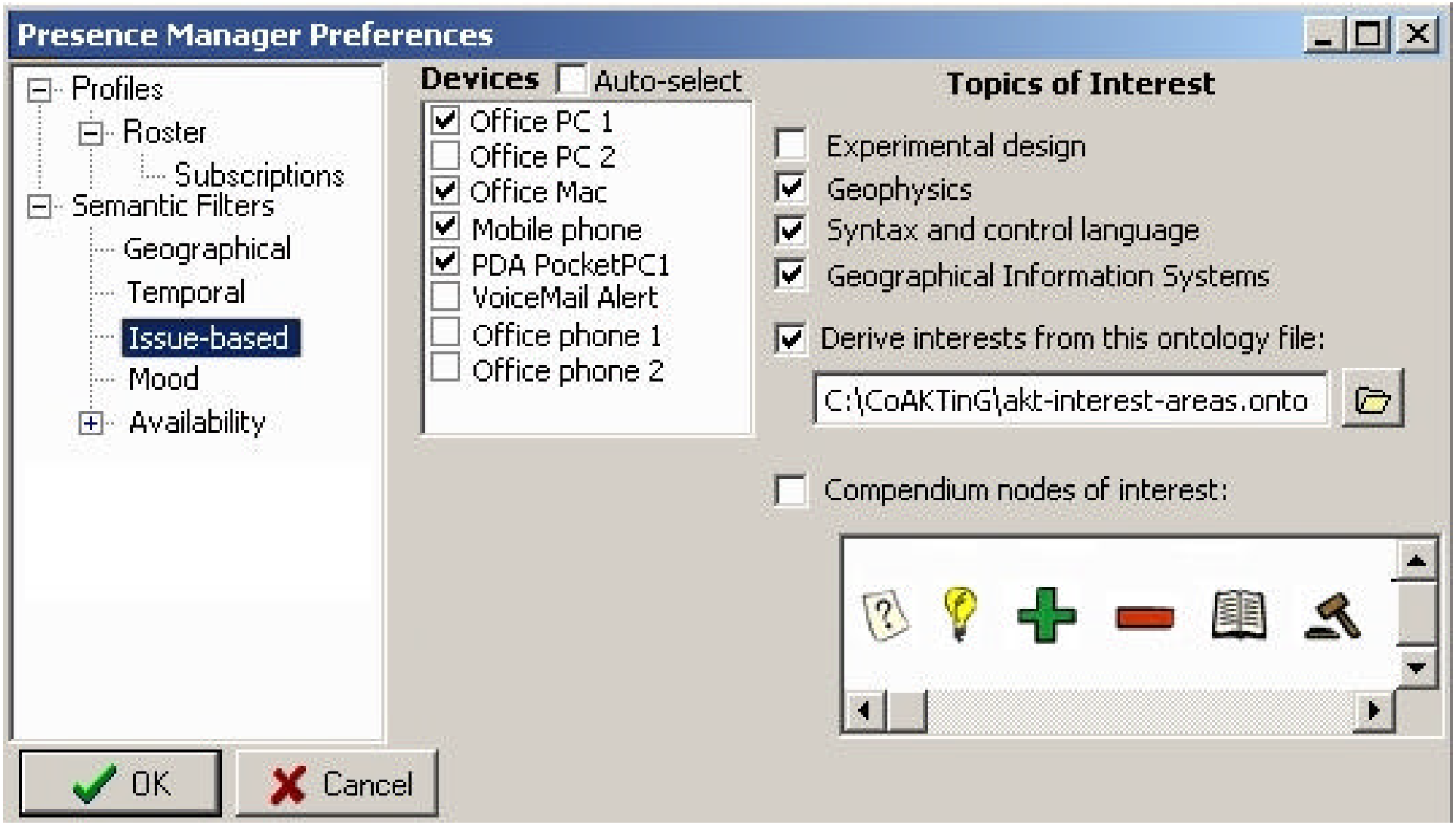
# Scenario

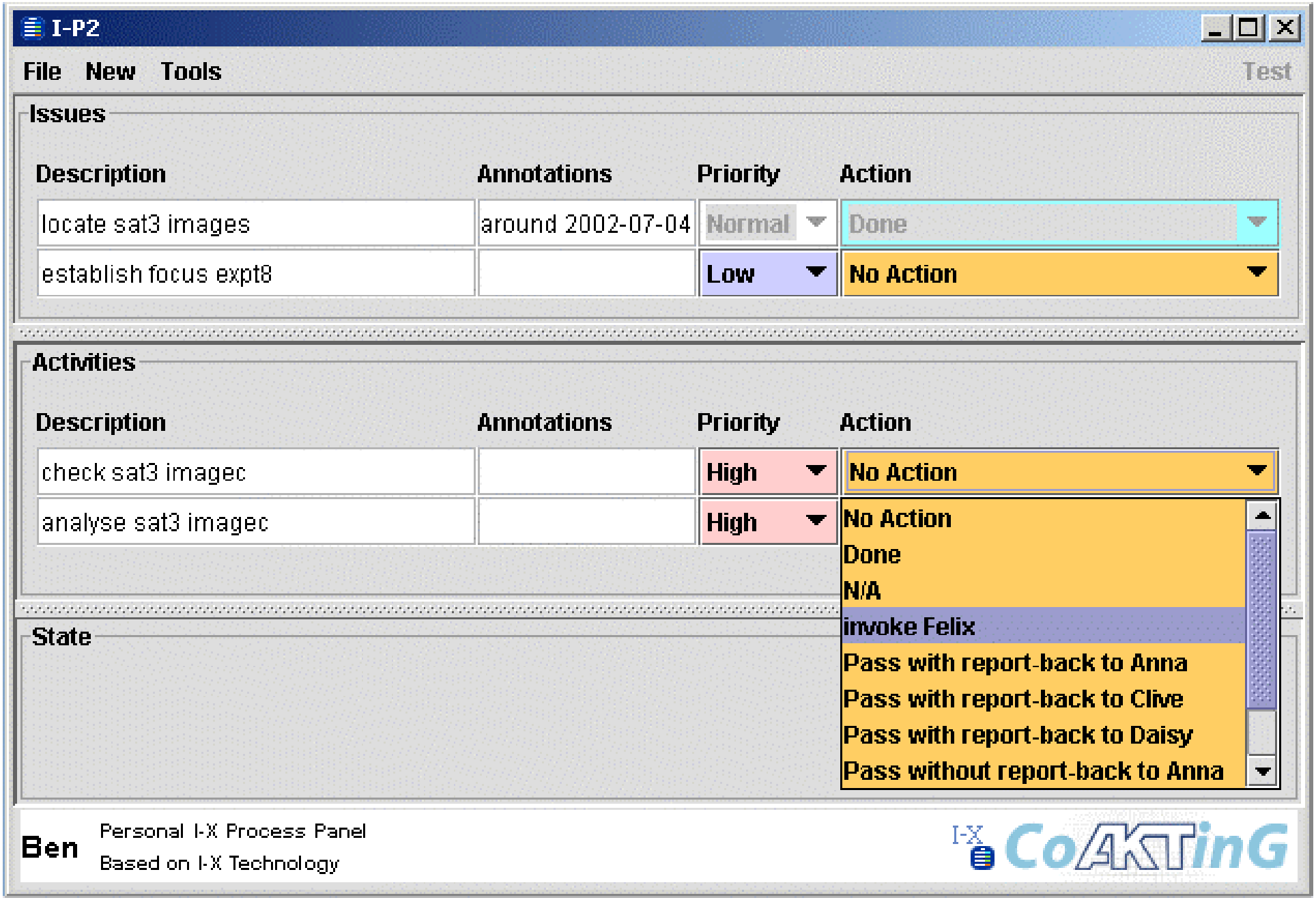
- A research team is holding a meeting over the internet to discuss the results of a recent series of experiments.
- Three of the team (**Anna**, **Ben** and **Clive**) are present via high bandwidth Access Grid meeting rooms that their institutions have, providing multi-screen video channels and high quality audio to the CollabClients on their laptops.
- **Daisy**'s university hasn't yet installed an Access Grid room, so she is joining them via a desktop CollabClient in her office.
- **Elli** cannot make the meeting, as she is on the road to a conference.

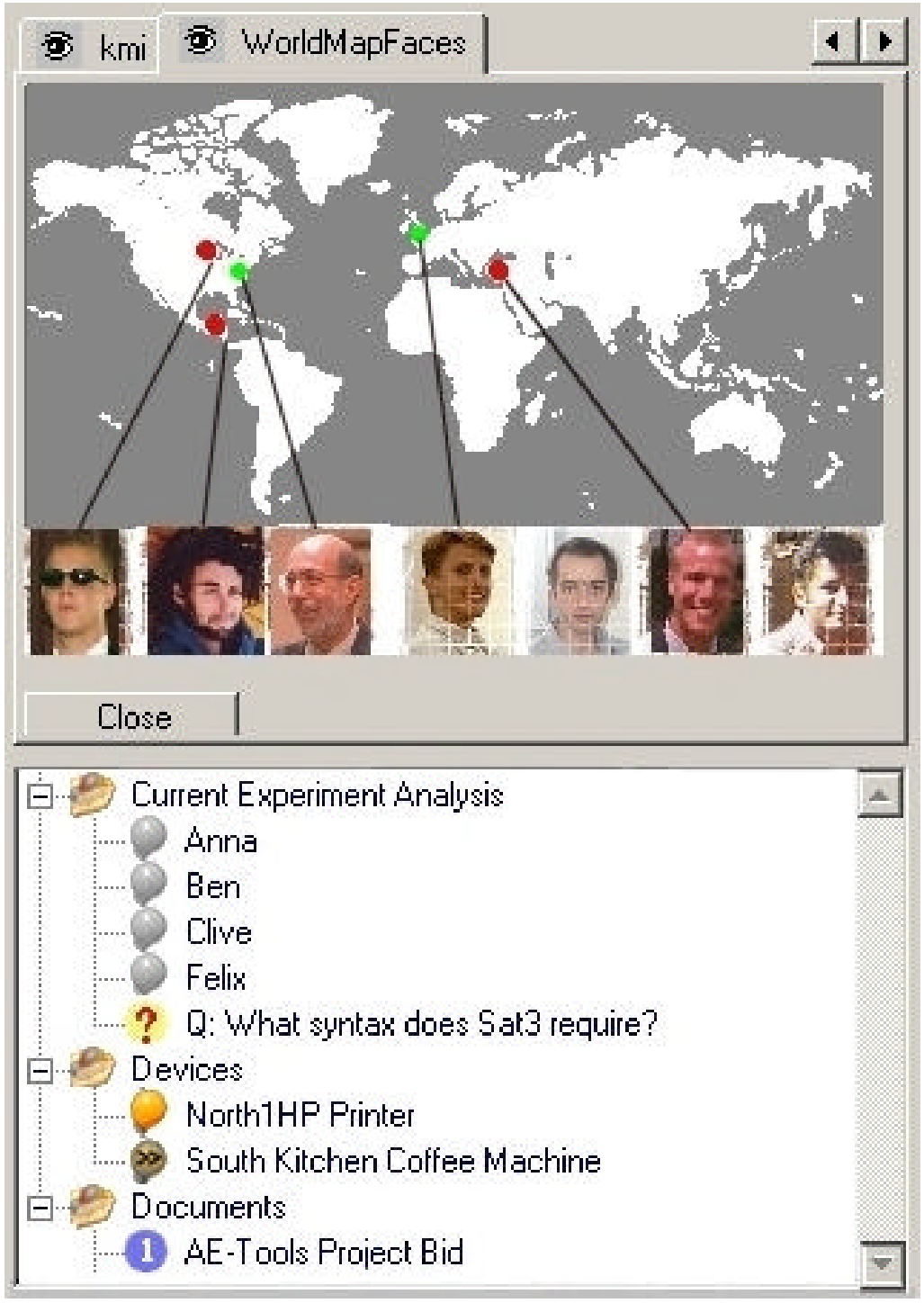

[Map]: Review of Expt 7
Sat1 output
Hypotheses?
Sat2 output
Sat3 output
What happened to the images?
Agenda:Review of Expt 7
What to focus on in Expt 8?
20020704.sat3.2207:05:34.jpg
Action items?

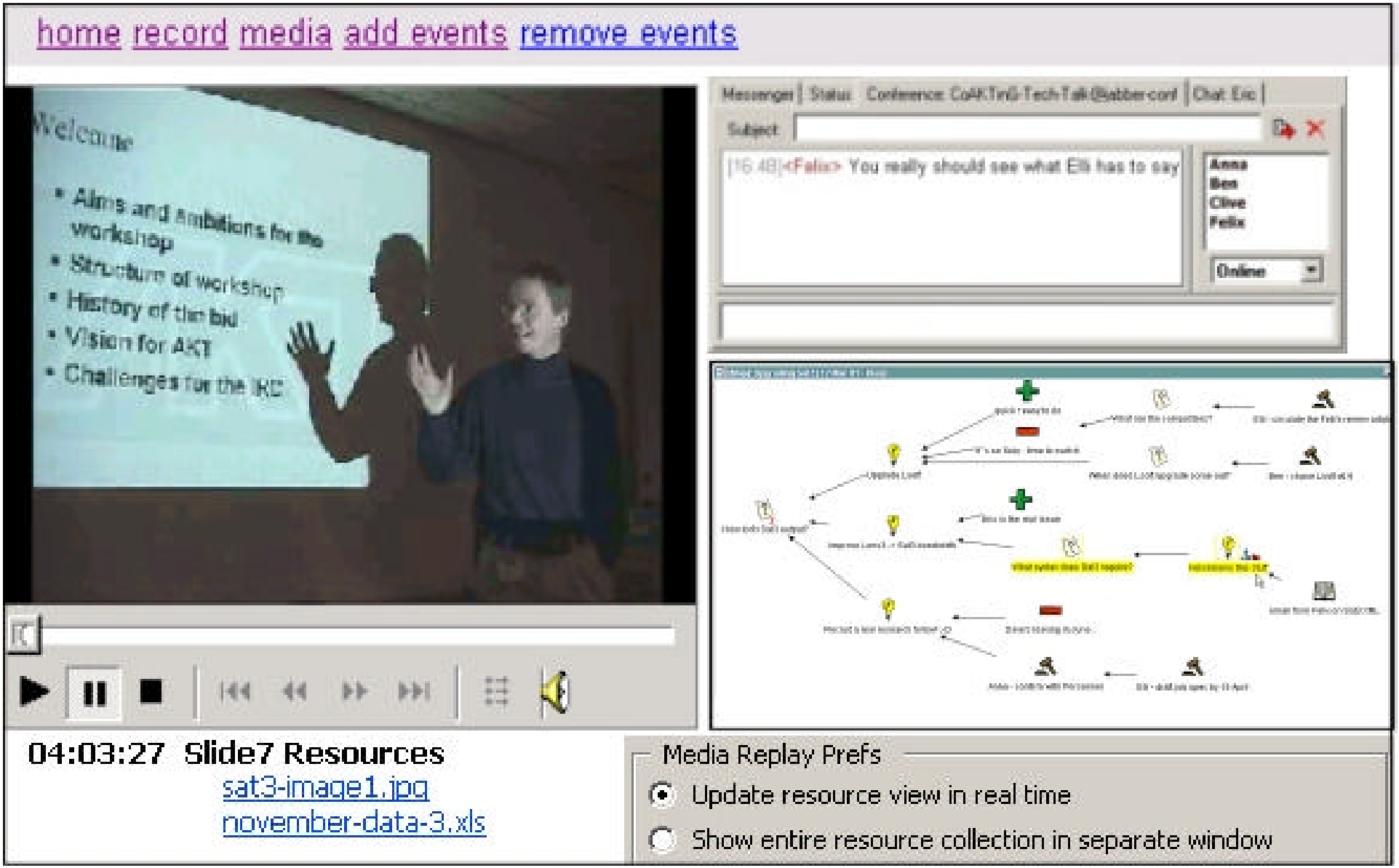

[Map]: Upgrading Sat3 [12 Mar 01 - Pisa]
quick +easy to do
What are the competitors?
Elli - circulate the Feb's review article
it"s so flaky - time to switch
Upgrade Lsoft
When does Lsoft upgrade come out?
Ben - chase Lsoft v6.5
this is the real issue
2
How to fix Sat3 output?
Improve Lens3 -> Sat3 bandwidth
What syntax does Sat3 require?
Felix knows this stuff
email from Felix on Sat3 XML
Recruit a real research fellow! ;-D
Dave's leaving in June...
Anna - confirm with Personnel
Elli - draft job spec by 15 April

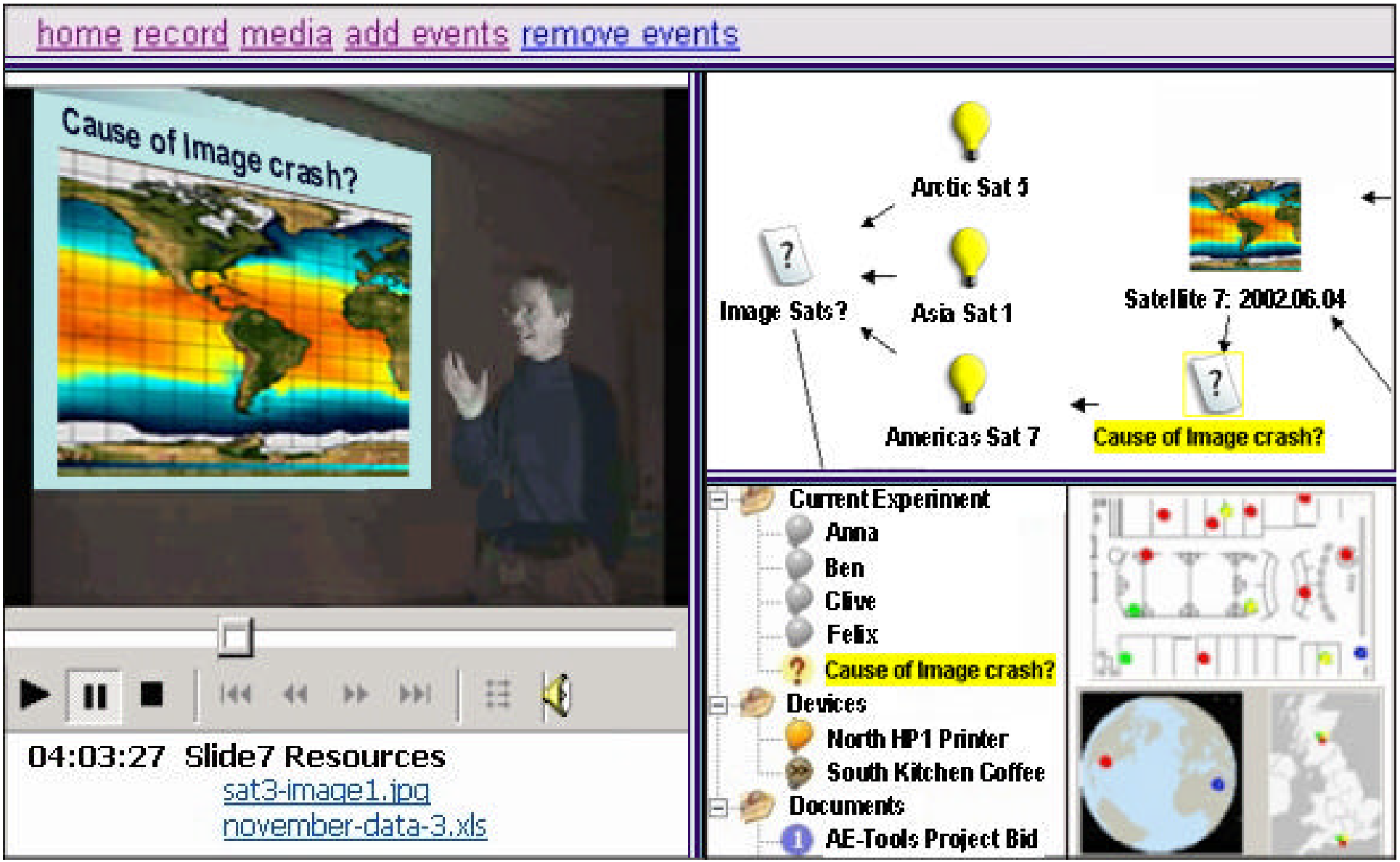

Messenger
Status
Conference: CoAKTinG-Tech-Talk@jabber-conf
Chat: Eric
Subject:
[16:48]<Felix> You really should see what Elli has to say
Anna
Ben
Clive
Felix
Online


Presence Manager Preferences
Profiles
Roster
Subscriptions
Semantic Filters
Geographical
Temporal
Issue-based
Mood
Availability
Devices
Auto-select
Office PC 1
Office PC 2
Office Mac
Mobile phone
PDA PocketPC1
VoiceMail Alert
Office phone 1
Office phone 2
Topics of Interest
Experimental design
Geophysics
Syntax and control language
Geographical Information Systems
Derive interests from this ontology file:
C:\CoAKTinG\akt-interest-areas.onto
Compendium nodes of interest:
OK
Cancel


I-P2
File
New
Tools
Test
Issues
Description
Annotations
Priority
Action
locate sat3 images
around 2002-07-04
Normal
Done
establish focus expt8
Low
No Action
Activities
Description
Annotations
Priority
Action
check sat3 imagec
High
No Action
analyse sat3 imagec
High
No Action
Done
N/A
invoke Felix
Pass with report-back to Anna
Pass with report-back to Clive
Pass with report-back to Daisy
Pass without report-back to Anna
State
Ben
Personal I-X Process Panel
Based on I-X Technology
I-X
CoAKTinG


kmi
WorldMapFaces
Close
Current Experiment Analysis
Anna
Ben
Clive
Felix
Q: What syntax does Sat3 require?
Devices
North1HP Printer
South Kitchen Coffee Machine
Documents
AE-Tools Project Bid

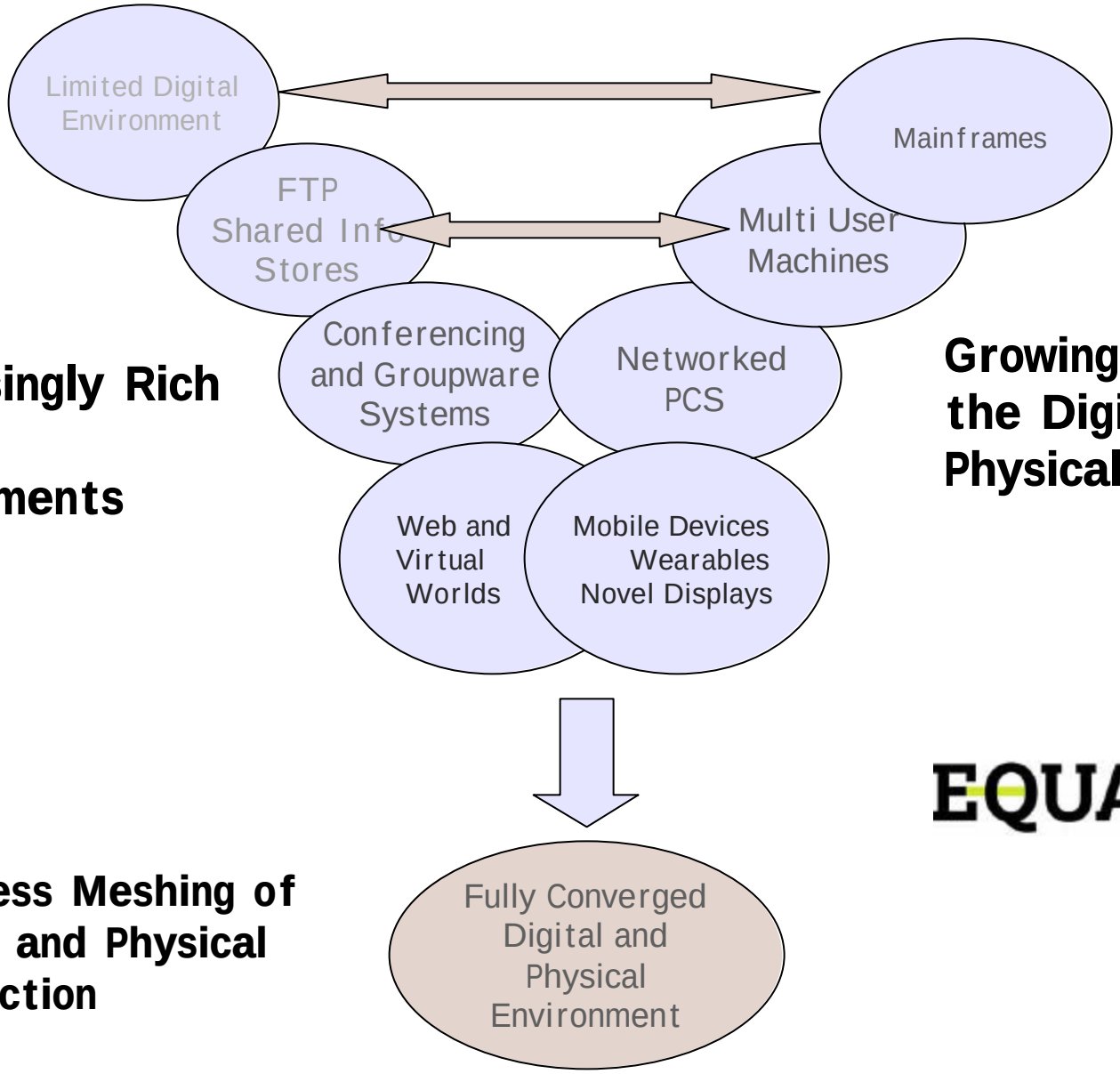

home record media add events remove events
Welcome
Aims and ambitions for the workshop
Structure of workshop
History of the bid
Vision for AKT
Challenges for the IKC
Messenger | Status | Conference: CoAKTinG-TechTalk@jabber.conf | Chat: Eric
Subject:
[16:48]<Felix> You really should see what Elli has to say
Anna
Ben
Clive
Felix
Online
04:03:27 Slide7 Resources
sat3-image1.jpg
november-data-3.xls
Media Replay Prefs
Update resource view in real time
Show entire resource collection in separate window


home record media add events remove events
Cause of Image crash?
04:03:27 Slide7 Resources
sat3-image1.jpg
november-data-3.xls
Arctic Sat 5
Image Sats?
Asia Sat 1
Satellite 7: 2002.06.04
Americas Sat 7
Cause of Image crash?
Current Experiment
Anna
Ben
Clive
Felix
Cause of Image crash?
Devices
North HP1 Printer
South Kitchen Coffee
Documents
AE-Tools Project Bid

# Pervasive Aspects

# Smart spaces

- Devices in the room enables us to capture continuous (realtime, multiway, multicast, ontologically informed, …) metadata
- Other devices provide ‘presence’ information
- Consider an experimental laboratory instead of a meeting room.




**Increasingly Rich Digital environments**

**Growing Presence of the Digital in the Physical World**

EQUATOR

**Seamless Meshing of Digital and Physical Interaction**

# Summary

- Using knowledge technologies (e.g. semantic web technologies) to enhance distributed collaboration in e-Science
- Implemented using (continuous) metadata in an ontologically principled way
- The Semantic Access Grid?

http://www.aktors.org/coakting/